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ABSTRACT

Career development for the next wave of competent leaders and technically trained workers during e-globalization is one of the most difficult challenges advanced nations face. Career development programs that begin in elementary education and have e-paradigms as a logical choice as the preferred scenario are needed by e-commerce in all its variations, health informatics and medical informatics, and an array of new careers in biotechnology, the Human Genome Project, and other fields. Knowledge managers and chief information officers are critical to viability in the private sector and equally essential at all levels of education in this communications revolution. These four steps are involved in being a chief information officer for digital dividends: (1) analyze the four initial questions (What are your personal career development interests and strengths? What awareness do you have about changes of business, engineering, education, or healthcare? What understandings are critical for these careers? and What cognitive, financial, and other outcomes do you hope to achieve from your activities?) and vision for your career; (2) critique progress you are making against that ideal; (3) know what knowledge management action plan you will create during the Summer Institute to realize a satisfactory return on investment; and (4) apply knowledge management concepts to your career development so you will experience part of the role of a chief information officer. (Attachments include information on how to access newsletters and bulletin board pages and a list of topics in strategic thinking newsletters/Web sites.) (YLB)

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CAREER DEVELOPMENT THROUGH KNOWLEDGE MANAGEMENT (KM): BE A CHIEF INFORMATION OFFICER (CIO) FOR YOUR DIGITAL DIVIDEND DESTINY

Programs for Higher Education Summer Institute
"The Higher Education Agenda: Revisiting Quality"
July 2001

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CAREER DEVELOPMENT THROUGH KNOWLEDGE MANAGEMENT (KM): BE A CHIEF INFORMATION OFFICER (CIO) FOR YOUR DIGITAL DIVIDEND DESTINY

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What are your personal career development interests and strengths?
What awareness about changes do you have of businesses, engineering, education, or healthcare?
What understandings are critical for business, engineering, education, or healthcare careers?
What cognitive, financial, and other outcomes do you hope to achieve from your activities?

Awareness of conversions include (a) advances in science and application of technologies, (b) change from paper-based formats to electronic formats, (c) globalization, and (d) restructuring. Application of biometric, card, voice, and wireless technologies are occurring to all aspects of life and work and in all sectors of economies. What is essential knowledge for your career goals?

Programs for Higher Education (PHE) requirements consist of (a) six core seminars plus two seminars in five specializations; (b) four practicums or three practicums plus a mosaic (four) of one unit directed study projects or problem solving methodologies courses; (c) two Summer Institutes; (d) comprehensive examination; and (e) a dissertation, a high quality major research project. Figure A is a Pattern of Degree Completion. PHE packages seminars in different sequences. A "Personal Data" sheet is enclosed so you can list the sequence of seminars in your cluster and then note the gist of ideas for practicums or record those you have completed. Linking seminars with practicums is essential. Analysis of literature for seminar papers can be the foundation for a proposal. Critique of sessions during Summer Institute could yield ideas for many proposals.

Curriculum could be defined as the set of learning activities available in "formal" contexts plus "informal" pursuits ranging from ad hoc to planned. Content in formal contexts only covers a fraction of critical knowledge essential in many occupations. Directed Study (DS) is a flexible way to pursue critical knowledge essential to your career goals. DS 1 could add clarity to Practicum 1. DS 2 could add clarity to P2, etc. A fourth unit could be a problem solving methodology course. A model of how Directed Study (DS) can promote high quality degree completion is a follows:

Directed Study		Practicums	Dissertation
DS 1	=	Clarity with P1	CLARITY in problem and issues,
DS 2	=	Clarity with P 2	analysis of research
DS 3	=	Clarity with P 3	critique of exemplary...
DS 4 or		DEVELOPMENT problem solving methodology course	

Development problem solving methodology is based on good research and expert judgment by informed individuals to guide the creation of a high quality product -- career development online program, curriculum for emerging careers, strategic technology plan, etc. DS 1, DS 2, and DS 3 could focus on content exploration for clarity in sections of a dissertation proposal and the problem solving methodology courses could yield clarity in the procedures for a good project.

CAREER DEVELOPMENT E-PARADIGMS

Numerous issues will be important in the years ahead. No issue, however, will be as important as the preparation of a critical mass of intellectual capital and high quality techforces to reengineer an economy and social infrastructure for a corridor, region, or state. Accelerating applications of complex technologies to business processes is fundamentally restructuring economies and society. Career Development (CD) for next waves of competent leaders and technically trained workers during e-globalization is one of the most difficult challenges advanced nations face.

Electronic Networked Communities (ENCs) evolved from computer scientists and electronic engineers communicating electronically in the 1940s to offering of four-year degree programs online via modem and personal computer in 1984. ENCs evolved rapidly by business through Electronic Data Interchange (EDI) that paved the way for Electronic Commerce (EC) in multiple forms including B2B, B2C, and M-commerce. Corporate training online evolved to meet needs related to the conversion from paper-based to electronic formats involving multiple cultures, laws, standards, and technology. Certificates and degrees online evolved in corporate universities and were followed by certificates and degree programs online by colleges and consortia of providers.

Although certificate and degree programs to prepare individuals for Information Technology (IT) traditional occupations such as database managers and network administrators have evolved in online formats and ENCs exist for continuing education, formal education in the United States has been slow to develop certificate and degree programs for emerging techforce roles, sometimes referred to IT related siblings. How do multinational corporations develop techforces to create a chain of suppliers to domestically manufacture goods using a standard technology infrastructure? How do some multinational corporations develop techforces to manage that knowledge and expand the chain of suppliers internationally with multiple standards to (a) penetrate new markets, (b) increase market share in countries where they already have a presence, and/or (c) reduce cost to gain competitive advantage as well as simply survive? What career development in-house programs and human resources development programs do corporations need to achieve goals?

Career development programs within formal education in the U.S. tend to acknowledge phases labeled (a) awareness, (b) exploration, and (c) specialization with concentration options. Career development (CD) programs, at their best in traditional format, should involve a broad range of service providers. Counselors and teachers must contribute to arousing awareness in students of clusters of occupations; they are essential in exploring with learners the emerging roles in ENCs. E-Commerce in all its variations, health informatics and medical informatics, and an array of new careers in biotechnology, the Human Genome Project, and other fields need CD programs that begin in elementary education and have e-paradigms as a logical choice as the preferred scenario. Knowledge Managers (KM) and Chief Information Officers (CIOs) are critical to viability in the private sector and equally essential at all levels of education in this communications revolution.

A scientific foundation for a human genome initiative existed in the 1980s. Los Alamos National Laboratory , Lawrence Liverpool National Laboratory, plus institutes and other labs played a role in laying a foundation for the Department of Energy (DOE) to begin a genome project in 1986. The Human Ge... oject (HGP) includes applications reaching into many

areas of the economy including (a) clinical medicine, (b) agriculture and livestock, (c) industrial processes, (d) environmental biotechnology, and (e) DNA fingerprinting with many applications. An Oak Ridge National Laboratory (ORNL) Website is a major gateway to the science and societal issues emanating from HGP. (http://www.ornl/hgmis) Commercial opportunities to improve Quality Of Life (QOL) are enormous for the countries, regions, and states with a critical mass of intellectual capital and scientists to benefit from new knowledge. But, human resources development is a major problem. Betty K. Mansfield, editor of Human Genome News, states

> ...the most extreme shortages of scientists in the life sciences occurs at multidisciplinary interfaces – the primary shortage being at the interface of computing and biology. Because life science research is increasingly interdisciplinary, we are suffering from a shortage of scientists who are cross trained in a number of fields needed to move our understandings of the life sciences forward (Personal Communications, July 3, 2001).*

A proposed DOE project, "Genomes to Life," has great potential for improving QOL.

The National Human Genome Research Institute (NHGRI) was established in 1989 to head the Human Genome Project for the National Institutes of Health (NIH), the federal government's primary agency for the support of biomedical research. The collective research of the 24 centers, divisions, and/or institutes of the NIH make up the largest biomedical research facility globally. The Division of Extramural Research (DER) contains units such as (a) Genome Informatics Program and (b) Genome Research Training & Career Development Program. The Division of Intramural Research (DIR) contains an Office of Technology Transfer. http://www.nhgri.nih.gov

A Biotechnology Industry Organization (BIO) in Washington, D.C. estimates that 1,200 biotech companies in the U.S. generated $22.3 billion in revenues in 2000. Although considerably less than the $500 billion of the pharmaceutical industry, biotech has grown rapidly thanks to the decoding of human genome. A BIO Education Program conducted at the International Biometric Convention on June 23-24, 2001, made extensive use of education information that can be mined from the National Biotechnology Information Facility (http://www.nbif.org).

Above-mentioned examples, and many others, are a broad array of challenges for commercial global leadership opportunities if educational enterprise CD programs can be created that are (a) synchronized with corridor, regional, and state techforce needs and (b) world class in quality. Corridor examples illustrate the need for an articulated educational enterprise approach to analysis of economic and technological variables that can be used to create visions and alternative scenarios as a basis for a Vision Quest strategies for CD in e-paradigm and traditional formats.

HOW TO BE A CIO FOR DIGITAL DIVIDENDS

First, analyze the four initial questions and VISION for your career. Second, critique progress you are making against that IDEAL. Third, what KNOWLEDGE MANAGEMENT (KM) action plan will you create during Summer Institute to realize a satisfactory Return On Investment (ROI). Fourth, apply KM concepts to your CD so you will experience part of the role of a CIO.

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* The author thanks Betty K. Mansfield for her contribution of materials in this packet.

NEWSLETTERS AND BULLETIN BOARD PAGES

Access http //www blackboard com/courses/webcom/ and enter as a guest.
Click on "Announcements" and then on "Course Documents."
Then, click on "Career Development e-Paradigms for Digital Dividends" and browse and mine.
You will find many Web sites listed in the document and you can link directly to the sites.
The applied dissertation on career/life planning by Kathy Green on page 18; link to her site.
Good state standards are listed on page 19; they include AK, MA, MI, NC, PA, UT, and WI.
The document was written as part of a Vision Quest initiative of the "Preparing Tomorrow's Teachers to Use Technology" (PT3) program of the U.S. Department of Education.

Then you may want to click on "Putting It All Together: Strategies for Program Assessment."
All six regional accrediting organizations require assessment of course and program student learning outcomes (SLOs) and an evaluation of assessment processes. This example focused on SLO for the business programs, graduate and undergraduate, and International Studies.

Then, click on "Warren Groff's Newsletters." A partial list of topics in newsletters is attached.
Directed Study (DS) holds great potential. It is an opportunity to select a topic of interest and collaborate with a facilitator to raise awareness and understanding. Analysis of the literature via DS could help with all aspects of a dissertation or practicum proposal (a) problem statement, (b) review of literature, and (c) methodology and procedures. Awareness about a topic like the many facets of globalization could lead to outstanding practicums and later to an applied dissertation.
English is very often the common language of commerce and diplomacy. How are countries in Asia (Japan, Korea, Taiwan) integrating English, and know-how and technology, into curriculum?
Review the project on voice recognition by Jack Espinal http //fairfax2 laser net/~jespinal/vr1 htm
Also, review the DS plan by Curtis Kelly in the December issue of "STRATEGIC PLANNING."

Scroll down and click on "Building Bridges Through Technology" and browse and mine material used in a workshop on developmentally appropriate learning units in biometric, card, voice, and wireless technology and on career development.

"Linking Courses to Practicums and Practicums to Courses" was a workshop for research faculty in the Programs for Higher Education in January 2001.

Also, browse the conceptual frameworks for the project by Kathy Green along with Prospectus, Proposal, and Applied Dissertation. And, review work on a plan for technology by Laurie Nalepa.

Then, click on "External Links" and "The Friendly Forum" and browse "The Friendly Forum: Class Discussion." Browse Asia Society, Globalization and the Family of IT Careers, Taiwan, Korea, etc. Access a few of the links. Consider requesting one the Asia Society Electronic Newsletters. Analyze competencies and skills from some of the "Family of IT Careers" links.
Review the educational goals for the Ministry of Education (MOE) in Taiwan and then critique "The Pacific Century" (105+) and "Pacific Rim Partnerships" in App. B3 (ED 372 239, 1994).

STRATEGIC THINKING NEWSLETTERS

A partial list of topics. Link directly to many Web sites for more detailed information.

February – a partial list of topics.
Connections between scholars and policy and decision-makers quote by Stanley Ikenberry.
National Center for Public Policy and Higher Education. Scandinavian High-Tech.
Telecomcities. Wired Towns. Online Technology Transfer. Incubators. EC Degree in jp.
Enterprise Business Intelligence. Customer-Centric and Customer-Empowerment.
Database Talking and Accessing the Internet With Your Voice. Globalization.
Conceiving a Master Plan for Wireless. Technologies for Access. Wireless Teaching.
E-Books. State Science and Technology Institute (SSTI). NSF Funding. Directed Study.

January – a partial list of topics.
Globalization. Next Generation of E-Business. Overview of 13 EC graduate programs.
Marketing and Wireless Devices. International Logistics. Customer effective e-services.
Land's End is expanding full-service e-commerce Web sites. Graphic arts and printing.
Advanced Technology Program (ATE) and Advanced Technology Education (ATE) at NSF.
Venture Capital for Distance Education. Distance Courses Required of All Students.
TIMSS - international comparison of math and all categories of science.
A Higher Education Act (HEA) commission has recommended BROADBAND for education.

December
Wireless Standards, Future Technology, Mobile Commerce (M-Commerce).
Midwest Planning – Could Chicago become a leader for the Midwest in wireless technology?
Planning for Digital Era Dividends with a specific focus on Africa.
E-Learning. Wireless On Campus. Web Service Design and Directed Study by Curtis Kelly.
May through October newsletters with some topics. Broadband Visioning. Digital State.

November
Biometric ID. Card technology in various countries. Voice recognition and verification.
The Wireless Revolution. Communications in 21st Century Globalization. A Foundation of Understandings for 21st Century Globalization. Competencies for a Digital Dividend.
Entrepreneurial Development. Electronic Newsletters. Directed Study on Voice Recognition.

October
Communications and Electronic Documents to 2010 and 2020. E-business explosion.
E-commerce evolution in graphic arts and printing (http://www.podb.com).
Critical thinking competencies and problem solving skills (ESSENTIAL).
Chief Information Officer (CIO) and Knowledge Manager (KM) roles (ESSENTIAL).
Sustaining communities of practice. International E-commerce. E-business essentials.
The state of online learning. Online learning. SYLLABUS. Executive education. Funding.

September
E-healthcare to reach $27B by 2004 (http://www.ecomworld.com).
Biometropolis at COMDEX - biometric systems such as face, eye, hand recognition applications.
Building a multilingual Web site (http://www.webtechniques.com).

Biometric and card Web sites - link directly to many Web sites (http://www.biometrics.org).
Electronic Newsletters (ENs) - Online Learning News, Virtual University, EDUCAUSE, + more.
Research Comapnies - Yankee Group, Gartner Group, Forrester, Meta Group, IDC, + more.
Electronic Commerce - EC World, Regional User Groups, associations, EC Product Center, +++
Middle Schools and High Schools Web sites in South Korea.

August
The Global Compact by the U.N. on turning the "Digital Divide" into a "Digital Dividend."
Asia Pacific, Kimberly Clark, GE Medical Systems and an Internet-based marketplace partnership.
Asia Pacific countries list to STRATEGICALLY THINK about Digital Dividend opportunities.
Institute for the Future, Forrester Research, PricewaterhouseCoopers' Technology Center.
Advanced Technology Program (ATP) - biometrics, e-books, and much more.

July
Rethinking Community - communication and information technologies are shaping "community."
Community goal setting projects and leadership development projects should be synchronized.
Globally competitive community research - assess the globally competitive community profile.

June
Ananova and Family of Digitized Talking Heads.
Web Weavers at Roosevelt Elementary School, Wauwatose School District.
Chief Information Officer (CIO) and Knowledge Manager (KM) roles in educational settings.
Videoconferencing for Learning Web sites.
About 150 to 175 electronic book publishers, many of whom don't bother with paper books.

May
Bridging The Gap: Information Technology Skills For a New Millennium, an ITAA report.
Educator's Website for Information Technology - includes curriculum standards for states.
Advanced Technology Education (ATE) of the National Science Foundation.
Enterprise Resource Planning (ERP) model for 4+4+4 education in online and traditional formats.
Milwaukee Public Schools and Washington High School in the Sherman Neighborhood Cluster.

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Access http://www.blackboard.com/courses/webcom/ and enter as a guest.
Click on "Announcements" and then on "Course Documents."
Then, click on "Warren Groff's Newsletters." Also, conceptual frameworks for dissertations by Kathy Green and Laurie Nalepa can be analyzed along with Prospectus and then the Proposal.

Then, click on "External Links" and "The Friendly Forum" and browse "The Friendly Forum: Class Discussion." Browse Asia Society, Globalization and the Family of IT Careers, Taiwan, Korea, etc. Access a few of the links. Consider requesting one the Asia Society Electronic Newsletters. Analyze competencies and skills from some of the "Family of IT Careers" links. Review the educational goals for the Ministry of Education (MOE) in Taiwan and then critique "The Pacific Century" (105+) and "Pacific Rim Partnerships" in App. B3 (ED 372 239, 1994).

CAREER DEVELOPMENT PARADIGM CONCEPTUAL FRAMEWORKS

AFRICA: GHANA, SENEGAL, AND SOUTH AFRICA

Career Development: Focus on Exploration and Specialization

Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge

Career Counseling Services — Curriculum Development Programs

Grade in "School"	Assessment, Counseling Guidance, Placement	Discipline Subject Centered Traditional Context English	Social Studies	Arts	Math	Nat. Sciences	Tech
11-14	Advanced Specialization						
9-10	Early Specialization						
6-8	Advanced Exploration						
4-5	Early Exploration						

Figure 1. A Paradigm to Enhance Career Development During Exploration and Specialization

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Career Development: Specialization with Business Concentrations

Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge

Career Counseling Services — Curriculum Development Programs

Early Specialization	Advanced Specialization	Concentrations
Business	CIOs and KMs in Businesses	KM in a Business
Market Analysis (MA)	e-MA in Africa, Trend Analysis	e-MA in Ghana
Manufacturing Chains (MC)	Automotive - Electronic Vehicles	
Distribution – Logistics	Air, Land, and Sea (ALS) to Africa	ALS to Ghana
Retail, Resellor		
Services	Financial, Government, Health Care	Health Informatics (HI)
Wholesale		
Customer Relations Mg		eCRM in Health Care

Figure 2. A Conceptual Framework for Advanced Specialization and Business Concentrations